

Accordingly, the scope of the invention should be determined not by the embodiment illustrated, but by the appended claims and their legal equivalent.

#### CLAIM

1. An apparatus for determining the velocity of a projectile moving along a trajectory, said apparatus comprising of:
  - a first sensing plane perpendicular to said trajectory comprising a plurality of light emitting devices and a plurality of light sensitive detectors, the light emitting devices being position to emit light beams to form a first light curtain in a plane perpendicular to said trajectory, the light sensitive detectors being position to form a first detecting plane perpendicular to said trajectory and parallel to said first light curtain, the said first detecting plane to be position close to the first light curtain so as to be able to detect reflected light from the first light curtain, the said reflected light as caused to be reflected as the projectile passes the first light curtain, the light sensitive detectors having the mean for producing a first signal indicative of the entry of the projectile into the first light curtain;
  - a second sensing plane perpendicular to said trajectory comprising a plurality of light emitting devices and a plurality of light sensitive detectors, the light emitting devices being position to emit light beams to form a second light curtain in a plane perpendicular to said trajectory, the light sensitive detectors being position to form a second detecting plane perpendicular to said trajectory and parallel to said second light curtain, the said second detecting plane to be position close to the second light curtain so as to be able to detect reflected light from the second light curtain, the said reflected light as caused to be reflected as the projectile passes the second light curtain, the light sensitive detectors having the mean for producing a second signal indicative of the entry of the projectile into the second light curtain, the said second sensing plane being position parallel to the said first sensing plane and aligned with said trajectory a distance apart; and
- means responsive to said first and said second signal for measuring the interval between the passage of said projectile through said first sensing plane to said second sensing plane for calculating a velocity corresponding to the measured time and the distance between said first and second sensing plane and displaying said calculated speed.
2. The apparatus of claim 1, wherein the light emitting devices comprises of infrared light emitting diodes.
3. The apparatus of claim 1, wherein the light sensitive detectors comprises of infrared sensitive detectors with amplification and ambient light rejection circuitry.
4. The apparatus of claim 1, wherein the detecting planes means comprises a plurality of openings with dimensional characteristics of a cylinder having a length much longer than the diameter of the opening to cause rejection of stray reflected light from being detected and allowing reflected light parallel to detecting plane from entering.
5. A method for determining the velocity of a projectile moving along a trajectory, said method comprising the steps of:

emitting first parallel light beams in a first direction perpendicular to said trajectory to form a first light curtain;  
detecting reflected light from first light curtain as projectile passes said first light curtain;  
deriving a first signal indicative of said projectile entering said first light curtain;  
emitting a second parallel light beams in a second direction perpendicular to said trajectory to form a second light curtain;  
detecting reflected light from second light curtain as projectile passes said second light curtain;  
deriving a second signal indicative of said projectile entering said second light curtain;  
determining the velocity of said projectile from said first and second signal comprises the steps of;  
recording the number of periods, C, generated by a clock source between said first signal and said second signal;  
calculating the velocity of said projectile by the following formula:

$$\frac{X}{C} = \text{velocity in miles per hour.}$$